Safety
Use of this unit as a construction heater or air conditioner is not recommended during any phase of construction. Very low return air temperatures, harmful vapors and operation of the unit with clogged or misplaced filters will damage the unit.

If this unit has been used for heating or cooling of buildings or structures under construction, the following conditions must be met or the warranty will be void:

- The vent hood must be installed per these installation instructions.
- A room thermostat must control the unit. The use of fixed jumpers that will provide continuous heating or cooling is not allowed.
- A pre-filter must be installed at the entry to the return air duct.
- The return air duct must be provided and sealed to the unit.
- Return air temperature range between 55°F (13°C) and 80°F (27°C) must be maintained.
- Air filters must be replaced and pre-filter must be removed upon construction completion.

WARNING
Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a licensed professional HVAC installer or equivalent, service agency, or the gas supplier.

The unit is certified for installation on noncombustible floors only. However, it may be installed on wood flooring, or on class A, class B, or class C material covered floors when used in downflow discharge applications when mounted on an S1CURB10-E1 roof mounting frame.

Adequate clearance shall be provided around air openings into the vestibule area. Provisions shall be made for proper operation and for combustion air and ventilation air supply. Unit must be adjusted for the temperature rise range and within the allowable external static pressure on furnaces with a duct system as listed on unit nameplate.
**United States**

The unit is ETL certified for outdoor installations only at the clearances to combustible materials listed on the unit nameplate and in figure 1.

Installation of the ETL certified units must conform with local building codes. In the absence of local codes, units must be installed according to the current National Fuel Gas Code ANSI Z223.1/NFPA 54.

When installed, the unit must be electrically wired and grounded according to local codes or, in the absence of local codes, with the current National Electric Code, ANSI/NFPA 70.

The current American National Standard (ANSI-Z233.1/NFPA54) National Fuel Gas Code is available from the following address:

American National Standard Institute Inc.
11 West 42nd Street
New York, NY 10036

The current National Electric Code (ANSI/NFPA 70) is available from the following address:

National Fire Protection Association
1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101

Use only the type of gas approved for use with this furnace. Refer to unit nameplate.

Never test for gas leaks with an open flame. Check all connections with a commercially available soap solution made specifically for leak detection.

**NOTE** - Furnace must be adjusted to obtain a temperature rise within the range(s) specified on the unit nameplate. Failure to do so may cause erratic limit operation.

**Canada**

The unit is ETL certified for combination heating/cooling for outdoor installations and non-residential use only at the clearances to combustible materials as listed on the unit nameplate.

Installation of ETL certified units must conform with current standard CSA B149.1, “Natural Gas and Propane Installation Codes” and applicable local codes. Authorities having jurisdiction should be consulted before installation.

The unit must be wired and electrically grounded according to local codes or, in the absence of local codes, current CSA Standard C22.1 Canadian Electrical Code Part 1. Installation of combination heating/cooling units must also conform with current CSA Standard B52 "Mechanical Refrigeration Code."
Connect Gas Piping

Two grommets are packaged with the flue exhaust and air intake hoods located in the gas heat section. Grommets are installed in the unit entry and gas heat division panel knockouts. An additional grommet is required when routing gas piping through the bottom of the unit.

Before connecting piping, check with gas company or authorities having jurisdiction for local code requirements. When installing gas supply piping, length of run from gas meter must be considered in determining pipe size for 0.5” w.c. (.12kPa) maximum pressure drop. Do not use supply pipe smaller than unit gas connection. For natural gas units, operating pressure at the unit gas connection must be a minimum of 6.0” w.c. (1.5kPa) and a maximum of 14” (3.50kPa) w.c. For LP/propane gas units, operating pressure at the unit gas connection must be a minimum of 11” w.c. (2.74kPa) and a maximum of 13.5” w.c. (3.36kPa).

When making piping connections a drip leg should be installed on vertical pipe runs to serve as a trap for sediment or condensate. A 1/8” N.P.T. plugged tap is located on gas valve for test gauge connection. Refer to Heating Start-Up section for tap location. Install a ground joint union between the gas control manifold and the main manual shut-off valve. See figure 2 for side entry gas supply piping.

Compounds used on threaded joints of gas piping shall be resistant to the action of liquified petroleum gases.

High Altitude Derate

Locate the high altitude conversion sticker in the unit literature bag. Fill out the conversion sticker and affix next to the unit nameplate.

Refer to table 1 for high altitude adjustments.

<table>
<thead>
<tr>
<th>TABLE 1 HIGH ALTITUDE DERATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altitude Ft.*</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>2000-4500</td>
</tr>
<tr>
<td>4500 And Above</td>
</tr>
</tbody>
</table>

*Units installed at 0-2000 feet do not need to be modified.

NOTE - This is the only permissible derate for these units.

Pressure Test Gas Piping

For natural gas units, operating pressure at the unit gas connection must be a minimum of 6.0” w.c. (1.5kPa) and a maximum of 14.0” (3.5kPa) w.c. For LP/propane gas units, operating pressure at the unit gas connection must be a minimum of 11” w.c. (2.74kPa) and a maximum of 13.5” w.c. (3.36kPa).

When testing the pressure of gas lines, the gas valve must be disconnected and isolated. Gas valves can be damaged if subjected to more than 0.5 psig (3.5 kPa).

WARNING

FIRE OR EXPLOSION HAZARD

Failure to follow the safety warnings exactly could result in serious injury, death or property damage. Never test for gas leaks with an open flame. Use a commercially available soap solution made specifically for the detection of leaks to check all connections. A fire or explosion may result causing property damage, personal injury or loss of life.

Two-Stage Gas Valve Adjustment

Gas manifold pressures should match pressures shown in table 2. On two stage gas valves, initiate a W2 thermostat demand to check high fire pressure before low fire pressure. See figure 3 or 4. With high fire operating, reduce the thermostat demand to W1 and check the low fire pressure. Refer to the Unit Controller manual to initiate a thermostat demand.

See Optional Modulating Gas Valve (MGV) section on units equipped with MGVs.

IMPORTANT - On 2-stage gas valves do not set low fire pressure lower than the certified minimum input rating listed in table 2.
### TABLE 2
**MANIFOLD INPUT PRESSURES** in.wg. (kPa)

<table>
<thead>
<tr>
<th>Unit</th>
<th>Natural Gas</th>
<th>Propane (LP) Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st Stage</td>
<td>2nd Stage</td>
</tr>
<tr>
<td>420-600</td>
<td>+0.2(+.05)</td>
<td>+0.3(+.08)</td>
</tr>
<tr>
<td></td>
<td>1.6 (0.40)</td>
<td>3.7 (0.92)</td>
</tr>
</tbody>
</table>

**HONEYWELL VR8205Q/VR8305Q SERIES GAS VALVE**

**FIGURE 3**

**WHITE RODGERS 36H54 GAS VALVE**

**FIGURE 4**

---

**Gas Heat Operation**

See the operating instruction plate on the unit for details.

**Proper Gas Flow (Approximate)**

1. Operate unit at least 15 minutes before checking gas flow. Determine the time in seconds for **two** revolutions of gas through the meter. (Two revolutions assures a more accurate time.)

2. **Divide the number of seconds by two** and compare to the time in table 3. If manifold pressure is correct and rate is incorrect, check gas orifices for proper size and restriction.

3. Remove temporary gas meter if installed. **NOTE**- To obtain accurate reading, shut off all other gas appliances connected to meter.

---

**TABLE 3**

**GAS METER CLOCKING CHART**

<table>
<thead>
<tr>
<th>Unit Input Rate (Btuh)</th>
<th>Natural 2 ft³ Dial</th>
<th>3 ft³ Dial</th>
<th>1 ft³ Dial</th>
<th>2 ft³ Dial</th>
</tr>
</thead>
<tbody>
<tr>
<td>325,000</td>
<td>22</td>
<td>54</td>
<td>27</td>
<td>55</td>
</tr>
<tr>
<td>500,000</td>
<td>14</td>
<td>36</td>
<td>28</td>
<td>36</td>
</tr>
<tr>
<td>525,000</td>
<td>13</td>
<td>34</td>
<td>17</td>
<td>34</td>
</tr>
<tr>
<td>800,000</td>
<td>9</td>
<td>22</td>
<td>11</td>
<td>22</td>
</tr>
</tbody>
</table>

**Note**: Table assumes standard temperature (60°F), pressure (30in.Hg.), and fuel heating values (Btuh/ft³). Apply pressure corrections in altitudes above 2000 ft.
TYPICAL GAS HEAT SCHEMATIC

This schematic is typical. See the wiring schematic on the unit for actual unit wiring.
This schematic is typical. See the wiring schematic on the unit for actual unit wiring.
Repair Parts Listing

When ordering repair parts, include the complete model number and serial number listed on the ETL rating plate - e.g. LGH480H4BH1Y.

<table>
<thead>
<tr>
<th>Gas Heat Section Parts</th>
<th>Cooling Parts</th>
<th>Electrical Control Parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat Exchanger</td>
<td>Compressors</td>
<td>Unit Controller</td>
</tr>
<tr>
<td>Combustion Air Assembly</td>
<td>Condenser Fan Motors</td>
<td>Compressor Contactors</td>
</tr>
<tr>
<td>Combustion Air Proving Switch</td>
<td>Condenser Fan Blades</td>
<td>Circuit Breakers (Opt.)</td>
</tr>
<tr>
<td>Burner Assembly</td>
<td>Condenser Fan Run Capacitors</td>
<td>Transformer (Control)</td>
</tr>
<tr>
<td>Burner Manifold Assembly</td>
<td>Freezestats</td>
<td>Transformer (Contactor)</td>
</tr>
<tr>
<td>Main Burner Orifices</td>
<td>Condenser Fan Mounting Bracket</td>
<td>Blower Contactor</td>
</tr>
<tr>
<td>Flame Roll-out Switches</td>
<td>Fan Grille</td>
<td>Limit, Blower Relay</td>
</tr>
<tr>
<td>Auxiliary Limit Controls</td>
<td>Indoor Blower Motors</td>
<td>Heat Relays</td>
</tr>
<tr>
<td>Ignition Electrode Assembly</td>
<td>Blower Wheel</td>
<td>Condenser Fan Relays</td>
</tr>
<tr>
<td>Ignition Lead</td>
<td>Expansion Valve</td>
<td>Capacitor CAB</td>
</tr>
<tr>
<td>Ignition Sensor Assembly</td>
<td>Distributor</td>
<td>Relay CAB</td>
</tr>
<tr>
<td>Sensor Lead</td>
<td>Exhaust Fans (Opt.)</td>
<td>Crankcase Heater</td>
</tr>
<tr>
<td>Combination Gas Valve</td>
<td></td>
<td>Disconnect Switch (Opt.)</td>
</tr>
<tr>
<td>Limit Controls</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Page 7
Optional Modulating Gas Valve (MGV)

Units equipped with optional modulating gas valves (MGV) contain two modulating gas valves in addition to two standard gas valves. See figure 5.

Operation

The Unit Controller will control modulating gas valves to maintain 110°F (default) discharge air during the heating cycle. The left heat section will operate when 25-50% of nameplate heat is needed. Both heat sections will operate when 50-100% of the nameplate heat is needed. The normally open MGV will allow full heating capacity should the MGV fail.

Start-Up

1- Operate the unit in heating mode according to the Heating Start-Up section in this manual.

**NOTE - BOTH GENERAL PURPOSE BOARD SWITCHES MUST BE OFF FOR NORMAL UNIT OPERATION. SEE FIGURE 6.**

2- After the unit has operated for 5 minutes, use the Unit Controller menu path MAIN > SERVICE > TEST > HEAT > HEAT 2. The unit will operate at maximum heating input.

3- Measure the manifold pressure at the gas valves. Manifold pressures should be:
   - GV1 & GV3:
     - Natural - 4.0”w.c.  LP - 10.8”w.c.
     - GV4 & GV5:
     - Natural - 3.7”w.c.  LP - 10.5”w.c.

4- After the unit has operated for 5 minutes, use the Unit Controller menu path MAIN > SERVICE > TEST > HEAT > HEAT 1. The unit will operate at minimum heating input.

5- Measure the manifold pressure at the gas valves. Manifold pressures should be:

Unit Controller Output

The Unit Controller 0-10VDC output to the MGVs increases to modulate valves further closed during a reduced heating demand. The Unit Controller 0-10VDC output to the MGVs decreases to modulate valves further open during a higher heating demand.